

# Nitrogen Management Worksheet

Through this worksheet you will be able to more accurately determine the ideal rate of nitrogen that needs to be applied to fields as part of the nitrogen management BMP. This worksheet accounts for nitrogen that will be removed through crop harvesting and nitrogen that will be added from other sources like manure and legume crop rotations.

To start complete the field plan and target yield tables on this page to determine estimated Nitrogen loss.

## Field Plan

**Step 1:** Enter all field names being used in your nitrogen management project.

**Step 2:** Enter the PIDS that will be included in your nitrogen management project.

**Step 3:** Enter the total #of acres of each field

**Step 4:** Select the crop that is being grown from the drop down menu.

Field Name	PID #	Area (a)	Crops Grown

Total Area

## Nitrogen Removed per Crop Yield

Enter target yields for the all crops being planted in the fields being used for the nitrogen management project. This will generate an estimate of Nitrogen removal (lb/a) for that yield.

For crops not listed download the AgPHD Fertilizer Removal App

Crop	Yield Goal	Unit	N Removed (lb/a)
		cwt	
		MT	
		MT	
		MT	
		MT	
		MT	
		MT	
		MT	
		MT	
		MT	
		MT	

# Manure Credit Calculator

Nitrogen can be input through the application of manure to a field. Accounting for manure credits can reduce the rate of nitrogen fertilizer that needs to be applied.

## Instructions

Only fill out the manure types you plan on using on the fields in this project.

**Step 1:** Enter the application rate and other values from your manure analysis report for the types of manure being spread.

Note: If you do not have a manure analysis report use example values as referenced.

**Step 2:** Use Table1 to fill out the "Incorporation Value" on the green box below.

**Step 3:** Use table2 to fill out the "Nitrogen Coefficient Value" in the Blue box below.

The estimated total nutrients available to the crop that year are indicated in the orange boxes.

Manure Type	Solid	Liquid	Poultry	Animal Averages for Estimation
Application Rate (tons/acre):				
C:N Ratio				Beef: 20, Dairy: 15, Poultry: 8, Swine: 11
Nitrogen %				Beef: 0.35, Dairy: 0.40, Poultry: 0.25, Swine: .51
Ammonium %				Beef: 0.09, Dairy: 0.16, Poultry: 0.64, Swine: .24
Incorporation Value				
Nitrogen Coefficient Value				
Total Amount of Nitrogen (lbs of N/acre)				

# Nitrogen Balance Worksheet

The Nitrogen Balance table considers nitrogen removals, sources (manure, legumes), and 4R considerations to give you an estimated optimal Nitrogen application rate. The legume, manure, and 4R tables are intended to provide a reference point only.

## Instructions

Please fill in the Biological Supply, Crop Removal (from the table on the first page), Manure Credit and Legume Credit values.

**Biological Supply:** If Soil Health testing shows high BNS, or Organic Matter is high (>3%), Otherwise leave blank

**Crop Removal:** Manually enter the value based on the yield goals entered in 'Crop Removal' table.

**Legume Credit:** Using table 3 enter the Legume Credit value in the green column of the Nitrogen Balance table

**Manure Credit:** Enter the manure credit value calculated from the table on page 2.

**Nitrogen Required:** This is the amount of Nitrogen that is expected to be removed from the field at harvest.

**Target Fertilizer N rate:** Automatically takes the '4R Efficiency' calculator values to adjust rates based on 4R suggested rates.

Biological Supply (lb/a)										
Crop Removal (lb/a)										
Legume Credit (lb/a)										
Manure Credit (lb/a)										
Nitrogen required (lb/a)										
Target Fertilizer N Rate (lb/a)										
Nitrogen Balance (lbs/a)										

Use these reference tables to enter the applicable value for the manure credit table incorporation and nitrogen coefficient values and nitrogen balance tables legume credit scenario.

## Manure Credit Reference Tables

Table 1 - Manure Incorporation Values	Solid	Liquid	Poultry
Within 1 day of application	0.75	0.75	0.90
Within 2 days of application	0.65	0.65	0.80
Within 3 days of application	0.65	0.65	0.65
Within 4 days of application	0.40	0.40	0.65
Within 5 days of application	0.40	0.40	0.55
Not Incorporated	0.25	0.25	0.50
Injected		0.95	

Table 2 - Nitrogen Coefficient Values	Solid	Liquid	Poultry
<b>If C:N Value is LESS THAN 15, and manure was applied....</b>			
Before June 15	0.20	0.20	0.30
June 15 to September 15	0.10	0.10	0.15
After September 15	0.00	0.00	0.00
<b>If C:N Value is BETWEEN 15 and 25, and manure was applied....</b>			
Before June 15	0.10	0.10	0.30
June 15 to September 15	0.00	0.00	0.15
After September 15	0.00	0.00	0.00
<b>If C:N Value is GREATER THAN 25, and manure was applied....</b>			
Before June 15	-0.20	-0.20	0.30
June 15 to September 15	0.00	0.00	0.15
After September 15	0.00	0.00	0.00

Reference tables courtesy of the government of Prince Edward Island Department of Agriculture and Land:

## Legume Credit Reference Tables

Table 3 - Estimates of Nitrogen Credits for Various Legume Scenarios						
Forage Type	Minimum % Legume	Yrs Established	N Credit (lbs/a)			
			Stand Fair (PEI)	Stand Good (PEI) 1	OMAFRA 2	Gov Manitoba 3
Legumes	50%	1			40	
Legumes	20%	>1			20	
Legumes	30%	>1			50	
Legumes	50%	>1			100	
Alfalfa	50%	2	36	71		
Alfalfa	50%	3	36	71		
Alfalfa	50%	4	36	71		70
Red Clover	50%	2	18	36		20
Red Clover	50%	3	18	36		
Rye Grass		1	0	-13		

# 4R Recommended Rate (optional)

This is an optional chart to fill in. Considering the 4R principles and applying them to nitrogen management can significantly reduce the rate of fertilizer that is applied to fields. This table gives you a rough estimate of the ideal rate considering source, timing, and placement.

## Instructions

**Step 1:** Using the drop down menus select the option being used for source, time, and placement. SR = Slow Release (e.g. Urease and/or Nitrification inhibitor). Commas indicate multiple sources for split applications. Blend assumes an NPK blend.

**Step 2:** Enter your standard Nitrogen rate OR leave default values populated from 'N Balance' worksheet

**Efficiency Factor:** A combined factor for source, time, and placement, based on research. Higher values indicate higher Nitrogen Use Efficiency (NUE)

**4R Adjusted Rate:** A calculated rate based on source, timing, and placement of Nitrogen.

N Source										
N Timing										
N Placement										
Standard Rate (lbs/a)										
Source, Time, Rate, Placement Efficiency Factor										
4R Adjusted Rate										